

## CLAIMS

What is claimed is:

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1. A plurality of laterally varying diodes including, in common, an n- collector region formed on a diode region, the n- collector region having a contact surface opposite the diode region and a depth extending from the contact surface to the diode region, with each individual diode having an independently selectable portion of the depth including an ion-implanted portion, the plurality of laterally varying diodes further including means for substantially electrically isolating each individual diode.
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2. A plurality of laterally varying diodes as set forth in claim 1, wherein the diode region is formed as a resonant tunneling diode region.
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3. A method for producing a plurality of laterally varying diodes including the steps of:
- a. providing a wafer having a diode region and an n- collector region having a depth;
  - b. masking the wafer to isolate the effects of ion-implantation to the desired portion of the n- collector region;
  - c. ion-implanting the desired portion of the n- collector region to a desired depth;
  - d. repeating steps b and c a desired number of times to produce a desired number of ion-implanted portions in the n- collector region; and
  - e. providing means for electrically isolating the individual portions of the diode region and the n- collector region corresponding to the ion-implanted portions in the n- collector region.
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4. A method for producing a plurality of laterally varying diodes as set forth in claim 3, wherein the diode region is a resonant tunneling diode region.
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5. A plurality of laterally varying diodes produced by the method of claim 3.
6. A plurality of laterally varying resonant tunneling diodes produced by the method of claim 3.
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7. A method for producing a plurality of laterally varying diodes including the steps of:
- a. providing a wafer having a diode region and an n- collector region having a depth;
  - b. masking a portion of the n- collector region;
  - c. etching the non-masked portion of the n- collector region to desired depth;
  - d. repeating steps b and c for a desired number of portions of the n- collector region;
  - e. uniformly ion-implanting the desired n- collector regions; and
  - f. providing means for electrically isolating the individual portions of the diode region and the n- collector region corresponding to the ion-implanted portions in the n- collector region.
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8. A method for producing a plurality of laterally varying diodes as set forth in claim 7, wherein the diode region is a resonant tunneling diode region.
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9. A plurality of laterally varying diodes produced by the method of claim 7.
10. A plurality of laterally varying resonant tunneling diodes produced by the method of claim 7.
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